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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,104	01/28/2000	Ken Yoshioka	503.38156X00	1799

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ARLINGTON, VA 22209

EXAMINER

OLSEN, ALLAN W

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/16/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/493,104

Applicant(s)

YOSHIOKA ET AL.

Examiner

Allan W. Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**P r i d f r Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 March 2003.
- 2a) ☒ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 12-23 is/are pending in the application.
- 4a) Of the above claim(s) 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-8 and 13-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/2/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

**Claims 1-8 and 13-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Each independent claim (1, 13, 14, 15, 16, 18, 19 and 20) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.**

The independent claims have been amended to require that the substrate be heated to a temperature below 230°C. The background section of the applicant's specification (page 4, lines 5-10) mentions that the magnetic properties of NiFe films are destroyed when the temperature reaches 230°C. As stated in the following rejections, this fact would make it obvious to use a temperature below 230°C, however, applicant's specification only discloses heating to a temperature below 200°C (page 9, lines 16-18; page 25, lines 26-27).

**Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

As previously indicated the examiner consulted with a Japanese language translator from the Foreign Patent and Scientific Literature branch of the USPTO Library. The examiner obtained an oral translation of the original Japanese priority document. With respect to the phrase "fluorine nitric acid" in claim 4 (and throughout the specification), this phrase is found in the English language translation provided by applicant. The PTO translator concurred with that translation. Therefore, the priority document is considered to provide support for "fluorine nitric acid" as originally presented in the translation filed with this US application. The subsequent

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amendments, including the present amendment reciting "fluoric acid and nitric acid" does not find support in the original priority document or in the originally filed English language translation. Therefore, the newly-presented amendment is considered to include new matter.

In the event that applicant chooses to amend claim 4 back to the originally filed language, the examiner requests that the such an amendment be accompanied with an explanation as to what exactly is meant by the phrase "fluorine nitric acid". Should the language be reinstated without providing such an explanation, the examiner would have to reinstate the 112 rejection that was set forth in the Office action of May 9, 2002.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,069,035 issued to O'Donnell et al. (hereinafter, O'Donnell) in view of U.S. Patent 5,269,878 issued to Page et al. (hereinafter, Page)**

O'Donnell teaches a method of etching a layer comprising a transition metal, such as PERMALLOY™. O'Donnell's uses a plasma containing chlorine and argon to etch the metal layer while the temperature of the substrate support is maintained at 40°C. Following the chlorine etch step O'Donnell teaches a second step of rinsing the substrate with 90° C deionized water in order to remove chlorine residue from the etched substrate. O'Donnell teaches that the metal layer may be patterned by etching through a patterned photoresist mask. See: column 1, lines 10-20, 30-35, 62-65; column 5, 21-25; column 6, lines 34-35; column 5, line 66 – column 7, line 34.

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O'Donnell does not teach using a hot plate to dry the substrate after it has been rinsed with water.

~~Page teaches drying the substrate with a hot plate after it has been rinsed with water~~  
(column 4, lines 50-53; column 1, lines 64-65).

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates.

The combination of O'Donnell and Page does not teach heating to a temperature of less than 230°C

It would have been obvious to one skilled in the art to not exceed a temperature 230°C because, O'Donnell is concerned with etching materials that are used in the manufacturing of magnetic heads and it is well known that the useful magnetic properties of these materials are destroyed when their temperature reaches 230°C.

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell and Page as applied to claim 1 above, and further in view of U.S. Patent 5,520,716 issued to Takagi et al. (hereinafter, Takagi).**

Claim 8 is dependent upon claim 1. O'Donnell teaches the limitations of claim 1 as noted in the above rejection. Additionally, it is noted that O'Donnell teaches that the method finds utility in the fabrication of magnetic heads. See column 1, lines 19-22 and column 7, lines 28-32.

O'Donnell does not teach that the PERMALLOY™ layer being etched is on a sintered Al<sub>2</sub>O<sub>3</sub>/TiC substrate.

Takagi teaches a sintered Al<sub>2</sub>O<sub>3</sub>/TiC substrate for magnetic heads.

It would have been obvious to one skilled in the art to use a sintered Al<sub>2</sub>O<sub>3</sub>/TiC substrate when applying O'Donnell's method to the fabrication of a magnetic head because the sintered Al<sub>2</sub>O<sub>3</sub>/TiC substrate of Takagi the fabrication of magnetic heads that have excellent

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smoothness. Also the head may be manufactured with high precision thereby proving heads with improved reliability.

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**Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,282,776 issued to Otsuka et al. (hereinafter, Otsuka) in view of O'Donnell and further in view of Page.**

Otsuka teaches a method of fabricating a magnetic head comprising each of the component layers recited in the instant claims (i.e. an upper pole made from an a NiFe alloy, a seed layer, a gap layer and a NiFe alloy lower pole/shield layer). Otsuka's method includes etching the seed layer and then plasma etching the gap layer with a Cl or F containing gas. See column 15, line 61 - column 16, line 21.

Otsuka does not teach removing chlorine or fluorine residue with a liquid rinse.

O'Donnell teaches removing chlorine or fluorine residue with a liquid rinse.

It would have been obvious to one skilled in the art to removing chlorine or fluorine residue from the structure of Otsuka by applying a liquid rinse as taught by O'Donnell because O'Donnell teaches that corrosion is prevented by removing the chlorine and fluorine residues with a liquid rinse.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates, and when so doing, it would be obvious to not exceed a temperature 230°C because it is well known that the useful magnetic properties of the magnetic head material are destroyed when the temperature of the material reaches 230°C.

**Claims 13, 15-18, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuka in view of O'Donnell and Page and further in view of U.S. Patent 5,607,599 issued to Ichihara et al. (hereinafter, Ichihara).**



Otsuka teaches a method of fabricating a magnetic head comprising each of the component layers recited in the instant claims (i.e. an upper pole made from an a NiFe alloy, a seed layer, a gap layer and a NiFe alloy lower pole/shield layer). Otsuka's method includes etching the seed layer and then plasma etching an oxide gap layer with a Cl or F containing gas. See column 15, line 61 - column 16, line 21.

Otsuka does not teach removing chlorine or fluorine residue with a liquid rinse.

O'Donnell teaches removing chlorine or fluorine residue with a liquid rinse.

It would have been obvious to one skilled in the art to removing chlorine or fluorine residue from the structure of Otsuka by applying a liquid rinse as taught by O'Donnell because O'Donnell teaches that corrosion is prevented by removing the chlorine and fluorine residues with a liquid rinse.

It would have been obvious to one skilled in the art to dry the substrate using a hot plate because Page teaches that this is the typical method of drying substrates and when so doing, it would be obvious to not exceed a temperature 230°C because it is well known that the useful magnetic properties of the magnetic head material are destroyed when the temperature of the material reaches 230°C.

Otsuka does not teach plasma etching the seed or shield layers with argon and chlorine.

Ichihara teaches etching NiFe alloy layers such as seed and shield layers with an argon and chlorine plasma. See column 4, lines 27-48

It would have been obvious to one skilled in the art to use the plasma etching method of Ichihara because Ichihara teaches that the use of Ar and BCl<sub>3</sub> allows one to obtain a high degree of etching selectivity between the various layers of the magnetic head as well as providing a means of fabricating the a magnetic head while maintaining a low processing temperature.

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***Respons to Arguments***

Applicant's arguments filed March 20, 2003 have been fully considered but they are not persuasive. Applicant's arguments against all of the rejections are based upon the position that none of the references teach heating to a temp. of  $<230^{\circ}\text{C}$ . The above rejections repeat those of the previous action but they now state that it would be obvious to keep the temperature of the substrate  $<230^{\circ}\text{C}$  or else the desired magnetic properties would be destroyed.

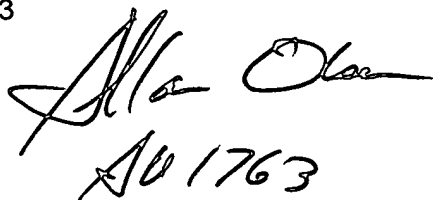
***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633. The general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.  
June 3, 2003



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